Section 3. Indiana Spatial Data Infrastructure Implementation: I-Team Plan

Introduction

The Implementation Team (I-Team) Geospatial Information Initiative is a joint project of the Federal Geographic Data Committee (FGDC), Federal Office of Management and Budget (OMB), the Council for Excellence in Government, Urban Logic, TIE, National States Geographic Information Council (NSGIC), National Association of Counties (NACo), and other strategic partners (Appendix J). As part of the effort to build a National Spatial Data Infrastructure (NSDI), the I-Team Initiative addresses the institutional and financial barriers to development of the NSDI at federal, state and local levels. It aims to offer a coherent set of institutional and financial incentives to make it easier for all levels of government and the private sector to collaborate in the building of the next generation of framework data. By aligning participant needs and resources, the I-Team Initiative will help all levels of government and the private sector to save money, migrate from existing legacy systems, make better user of existing resources, and develop the business case for additional public and private resources.

The Indiana Geographic Information Council (IGIC) has endorsed the Office of Management and Budget's (OMB) I-Team concept for assessing the status of the Federal Geographic Data Committee's (FGDC) Framework Data Themes. IGIC established itself as Indiana's I-Team in January 2001. The goal of Indiana's I-Team Report is to devise a plan for development and long-term maintenance for each theme. This report represents the first phase of that effort.

The OMB Information Initiative to align the needs and resources to continue to develop the National Spatial Data Infrastructure provides public and private agencies in Indiana an opportunity to focus on mutually beneficial partnerships. The results of these efforts will help to provide integrated information for analysis of issues and decision-making at federal, state, local, and Tribal levels of government. Further it will provide a common frame of reference for communicating information and concepts of complex issues to citizens.

Overview of the Plan
This Implementation Plan identifies the organizational structure of the I-Team for Indiana, defines a process based on planning and policy issues for prioritizing data themes that will contribute to building Indiana's part of the NSDI, and provides a summary of seven framework data themes and supplemental data themes that will be included in the prioritization process.
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Jurisdiction
This plan addresses issues and information needs statewide for Indiana and reflects the collaboration of federal and state agencies, academia, the private and not-for-profit sector, and representatives of local governments. State agency coordination and strategic planning is the jurisdiction of the State GIS Coordinator and the State Agency GIS Task Force (Appendix L). IGIC and the State Agency GIS Task Force work closely and cooperatively together to ensure

cohesiveness and synergism of the state and statewide GIS coordination efforts.

Implementation Team

The Indiana Geographic Information Council (IGIC) leads the statewide GIS data coordination efforts in Indiana. IGIC membership encompasses federal agencies, state agencies, local government, academia, private and not-for-profit sector participants. IGIC has met and agreed to serve as the I-Team for Indiana. Members of IGIC, in addition to participants from the broader GIS community, have been identified to participate in the I-Team (Appendix C: Council Members, Roles and Responsibilities). Committee working groups of IGIC typically meet monthly and address specific joint projects. The IGIC Data Sharing Committee has developed concise framework data abstracts that summarize the current state, and define a plan for future development and maintenance of each framework data theme. Each abstract follows the I-Team template. Each theme has been assigned "champions" from the IGIC Data Sharing Committee who are responsible for writing the abstract, gathering comments, and submitting the final abstract to IGIC for compilation.

The next phase of the project will be to transform each abstract into a long-range plan for theme development and maintenance, and to develop more detail and strategy for coordinating with local governmental units. Within this structure, a federal champion will be identified for each theme as requested by OMB. The Financial Team liaison is the Chair of the IGIC. IGIC meets quarterly and will report to the FGDC annually or as needed.

Approach

Framework Approach. The framework is a collaborative effort to create widely available source of basic geographic data. The framework represent "data you can trust" – the best available data for an area, certified, standardized, and described according to a common standard. It provides a foundation on which organizations can build by adding their own detail and compiling other data sets.

Many of the resources organizations spend on GIS go toward duplicating other organization's data collection efforts. The same geographic data themes for an area are collected over and over again, at great expense. The framework will greatly improve this situation by leveraging data collection efforts so data can be shared. In this environment, users can perform cross-jurisdictional and cross-organizational analyses and operations, and organizations can funnel their resources into applications, rather than duplicating data production efforts.

The I-Team has defined priority data themes and inventoried the progress of data development, standards, identification of custodians, and funding requirements. These include the following the seven framework themes defined by the FGDC:

1. Geodetic Control - reference system of monumented points and GPS control stations
2. Orthoimagery - georeferenced image or remotely sensed data
3. Elevation - elevations of land surfaces and the depths below water surfaces
4. Transportation - includes roads, trails, railroads, waterways, airports and ports, bridges

and tunnels
5. Hydrography - includes surface water features such as lakes, ponds, rivers, streams, canals, and shorelines
6. Governmental Units - units of government includes state, counties, incorporated places, legal civil divisions, Am. Indiana reservations
7. Cadastral Information - past, current and future rights and interests in real property, includes surveys, legal descriptions, parcels, cadastral reference systems e.g. PLSS, and publicly administered parcels e.g. military/state parks/etc.

Selected priority layers (additional layers including soils and geology) currently are assigned to work groups. Where funding has been identified and work is already in progress, this work will be documented in the inventory process and will continue unimpeded and accelerated where possible. In cases where funding has not been identified, these layers will be included in the prioritization within the scope of this plan.

Process. The IGIC Data Sharing Committee has completed the initial abstract inventory of the priority layers contained in this Report. In the next phase of this process, a task forces will be identified for each framework layer. Each task force will represent agencies and organizations having mandated responsibility and/or programmatic need for the data. Each group will coordinate completion of the following:
- Detailed inventory of the existing data and provide a status report
- Develop costs estimate and time requirements for completion of the data layer
- Describe how investment has been leveraged to provide data for multiple uses
- Identify standards and document
- Develop a strategy for completing the data layer
- Assign responsibility / custodianship for creation, integration, and maintenance of the data layer
- Provide data access through the IGIC or agency based web sites

Prioritization of Framework Layers. IGIC is in the process of identifying the driving issues for each level of government. An initial list of issues is discussed in this plan; however, a more comprehensive analysis of the issues and identification of overlapping information needs will addressed in future meetings. We anticipate this will be an iterative process and issues can be revised regularly. Also, some agencies may require additional time for their management to prioritize issues. As the issue analysis is completed, the matrix in *Table 1* will be updated to reflect priority issues and identify the framework layers that are needed to address each issue. As shown on the matrix, framework layers are needed to address most issues, so it is anticipated that even as issues change, many of the data requirements will not change. It is anticipated that some layers may receive higher priority from time to time and some areas of the state may receive higher priority than others but this flexibility will be workable through the plan.

Budget and Schedule. IGIC meets quarterly, and several of its committees meet monthly. It is planned to place I-Team issues on Committee agendas as needed, but at least quarterly. Those meetings will result in a report that describes progress, identified needs, and alterations to the

Implementation Plan. IGIC will begin immediately to identify funding sources to fulfill needs and to enhance collaborative efforts to secure resources needed to fully implement the Plan.

Standards. The IGIC has adopted the *"Indiana Metadata Standard"* (Appendix H) as the standard for the Indiana Geographic Information Catalog.   Data standards for the framework themes and critical layers will be developed jointly by the creation agencies if national standards do not currently exist. The IGIC Data Standards and Recommendations Committee has released *"Projections, Datum, and Coordinate Systems"* and *"Map Scale and Accuracy"* standards for public review and comment, and are anticipated to be ratified October 20, 2001. http://www.in.us/ingisi/committees/standards_and_recommendations.html. Each framework layer will have documented standards. These and other IGIC standards are intended to achieve consistency and interoperability.

Driving Issues
Required Data:
The I-Team, working with the agencies they represent, identified many of the State's most serious issues. The I-Team then determined which data themes are required to successfully address each issue, summarized in the following table.

Table 1. Matrix of issues and associated data requirements.

INDIANA ISSUES	Geodetic Control	Digital Ortho-Imagery	Elevation	Transportation	Hydrography	Boundaries	Cadastral	Demographics	Wetlands	Geology	Wildlife habitat	Climate	Ground Cover	Land Use	Soils	Telecommunications	Critical facilities/Infrastructure	Environmental
Economic Development	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Education / Enrollment	X			X		X		X	X					X		X		X
E-gov Service Delivery	X	X	X	X	X	X	X	X								X		
Livable Communities /Quality Growth	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Rural Economies	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Septic Systems/Combined Sewer Overflows	X	X	X		X	X	X		X	X			X					
Agriculture/Farmland Preservation	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			X
Environmental Protection	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			X
Emergency Mgt /E-911	X	X	X	X	X	X	X	X		X						X	X	X
Law Enforcement	X	X	X	X		X	X	X								X	X	
Brownfields	X	X	X	X	X	X	X			X	X		X	X	X	X	X	X
Traffic/Transportation	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X
Redistricting / Census	X	X		X		X	X	X								X	X	
Epidemiology/ Health Care	X	X		X		X	X	X								X	X	X
Social Services	X	X		X		X	X	X								X	X	

Budget and Schedule Summary

The I-Team designated the seven FGDC framework data catagories, along with soils and geology, as the top priorities. We also recognized that priorities could be based on funding opportunities, that is, if funding is currently available for a given theme, should it be a priority.

Data Catagory	Time Frame	1st Year Cost	Total Cost
Geodetic Control			
DOQQs	10 years		$4,928,000
Elevation			$436,770
Transportation			
Hydrography	5 years	$50,000	$255,000
Boundaries			
Cadastral	10 years		$12,000,000
Soils	*4+ years*	*$40,000*	*$1,600,000*
Geology			

Framework Inventory Summary

Geodetic Control

The Indiana High Accuracy Reference Network (HARN) stations are critical to the spatial development of Indiana; from utilities to highways, Geographic Information Systems (GIS) to Precision Farming. The HARN stations will become the basis of how we determine where we are in the 21st century.

The first phase of the HARN established 126 stations in Indiana. The NGS, Schneider Inc., Plumb Tucket & Associates, Indiana Department of Transportation (INDOT), Indiana Department of Environmental Management (IDEM), and many others (see: contributors) made observations in the summer of 1997. Data processing was undertaken by the National Geodetic Survey. For the second phase of the HARN, Woolpert was contracted, by the Office of the Indiana State Geodetic Advisor (OISGA), to observe an additional 25 stations in Indiana. Observations took place during the summer of 1998. Each of the Indiana counties has at least one HARN station. Refer to the Indiana HARN web page and the Office of the Indiana State Geodetic Advisor (http://bridge.ecn.purdue.edu/~oisga/).

Digital Ortho-Imagery

Indiana was a USGS pilot study state for statewide comprehensive digital orthophotography collection. As a result, Indiana has a complete first generation seamless coverage of Digital Orthophoto Quads (DOQQs) for the state at one-meter resolution. The DOQQs can serve as a base for development of several other statewide framework layers. The DOQQs are from 1997-1999 and were developed at a cost of approximately $800.00 per quarter quad. Complete coverage of second generation DOQQs for the State would cost approximately $4,928,000. The

I-Team has discussed a revision cycle of ten years.

Elevation
Geospatial elevation data are utilized by the scientific and resource management communities for hydrologic modeling, resource monitoring, mapping, and visualization applications. The USGS National Elevation Dataset (NED) Digital Elevation Model (DEM's) currently provide complete coverage for Indiana at 30 meter resolution. The NED is a seamless mosaic of best-available elevation data. An estimated $436,770 is required to complete once-over state coverage for 10-meter DEMs. Estimate based on the current cost of $690 to produce one 10-meter DEM for the remaining 633 7.5-minute quadrangles in the state.

Transportation
Currently, the Indiana Department of Transportation is updating its certified roads database and GIS for system 1, 2 and 3 roads statewide. System 1 roads are nearly complete and rectified to the statewide 1:12,000 digital orthophotography (DOQQs). The INDOT roads database operates a linear referencing system based on county log mile, cumulative log miles, and referencing posts. Additionally, U.S. Census Tiger 2000 Line File is a complete 1:100,000 centerline street-base for the state of Indiana and is linearly referenced based on an address system. The street address referencing system is critical to issues requiring address matching/geocoding applications. The Tiger Line File has not been geographically rectified to Indiana's DOQQ's.

Hydrography
The Hoosier National Forest is on the USGS priority list for high-resolution US Geological Survey (USGS) National Hydrology Dataset (NHD), and provides the sub-basin hydrologic unit codes (HUC) numbers and information about quads of various source 1:24,000 scale data. Additionally, there are two pilot projects, the Eel and Upper Wabash watersheds, to be done by the USGS Mapping Applications Center (MAC) in Reston, VA, and a number of partial watersheds being completed with surrounding states.

The Indiana Department of Natural Resources (IDNR) is the USGS direct partner for high-resolution NHD in Indiana. USGS and IDNR have signed a Joint Funding Agreement (JFA) for high-resolution NHD. Estimates to complete a statewide high-resolution NHD coverage will cost a total of $510,000, with the state's share being $255,000 (50-50 actual costs with USGS). This estimate is figured over an approximate two-year timeframe.

Boundaries
There are multiple sources for boundary related data in Indiana. Indiana Department of Transportation has upgraded municipal corporation boundaries that are rectified to DOQQs 1:12,000 scale; the coverage is complete statewide with ongoing maintenance. Costs for the boundaries theme are yet to be determined.

Cadastral
In Indiana, cadastral (real property) data development for private lands is under the jurisdiction of individual counties. Approximately 32 counties have completed or have begun to complete digital

GIS coverage of their cadastral data, leaving 60 that need collection, correction, and validation. Currently there are no statewide standards for consistency of cadastral data development. To complete a cadastral layer for the State of Indiana, an estimated total of $12 million will be required. This figure represents varying degrees of work for the 92 counties in Indiana, and does not include the ongoing maintenance necessary to keep the layer current. The above figure is an estimate based on number of parcels at $7.00 per parcel for data conversion and parcels at $0.50 per parcel to bring existing digital parcels to a state standard.

Geology

Soils

Twelve counties have soils layers completed (GIS mapping and certification) by the Natural Resources Conservation Service (NRCS); 80 counties remain to have GIS data sets built and NRCS certified before inclusion in Indiana's SSURGO Database. Estimated costs to complete the detailed soil survey GIS mapping and develop a SSURGO Database theme is about $1,600,000. The total estimated allocation of funds for the 20 counties per year goal for SSURGO data is about $400,000. This total is to complete statewide soil survey mapping and SSURGO Data Base development over approximately the next 4 years.

SSURGO* Digitizing Status

USDA NRCS
Natural Resources Conservation Service

Status
- Certified (12)
- Completed - Awaiting Certification (9)
- In Progress (8)
- Scheduled (16)
- Pending (47)

*Soil SURvey GeOgraphic database

Data Current as of 8/29/01